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BROADCAST PROGRAM RECORDING APPARATUS
USING ELECTRONIC PROGRAM GUIDE

BACKGROUND OF THE INVENTION

1. Field of the Invention

The present invention relates to a broadcast program recording apparatus using an EPG (Electronic Program Guide). More particularly, the present invention relates to a broadcast program recording apparatus which is capable of detecting a time at which a broadcast program which is being recorded is changed in order to enter a new broadcast program.

2. Description of the Related Art

Conventionally, in media which provide a large number of programs, such as digital satellite broadcasts, FM multiplex broadcasts, or the Internet, an EPG has been introduced to improve the convenience of selecting a broadcast program. For example, in a digital satellite broadcast, broadcast program information which is transmitted, such as a channel number, a program name, a schedule, etc., is decoded by an EPG decoder within a receiver, and the EPG data is displayed on a television monitor (on-screen display). A selection can be made from these on-screen displayed broadcast programs, and the selected broadcast program is used to make an entry in

recording management information so as to perform recording management. A new broadcast program to be entered into this recording management information can be entered and stored by giving instructions using a remote control unit, etc.

However, as described in the conventional art, there is a problem in that entering a new broadcast program into recording management information can be performed only when recording starts. For example, even if attempts are made to enter a new broadcast program while recording is being performed, the new broadcast program cannot be entered into the recording management information and retrieval at later time cannot be performed.

SUMMARY OF THE INVENTION

Accordingly, an object of the present invention is to provide a broadcast program recording apparatus in which entering a new broadcast program into recording management information can be performed even if a broadcast program is being recorded.

To achieve the above-mentioned object, according to the present invention, there is provided a broadcast program recording apparatus using an EPG, comprising: a tuner section for receiving a broadcast program containing broadcast program information; an EPG decoder section for decoding the broadcast program information received by the

tuner section; a controller having recording management information which is created by extracting a broadcast program to be recorded from the decoded EPG data; and a recording section for recording the broadcast program on the basis of the recording management information, wherein the controller compares the current time with a broadcast program start time contained in the EPG data, and enters a new broadcast program into the recording management information when a broadcast program which is being recorded is to be changed or immediately after it is changed.

The EPG decoder can accept broadcast program information directly from the outside, and the current time is produced from time information input from the outside.

In the manner as described above, as a result of being able to enter a new broadcast program when a broadcast program is to be changed, it is possible to enter the new broadcast program without a user having to perform a special operation, thereby improving the ease of operation.

The above and further objects, aspects and novel features of the invention will become more apparent from the following detailed description when read in conjunction with the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

Fig. 1 is a block diagram of a broadcast program

recording apparatus using an EPG according to a first embodiment of the present invention;

Fig. 2 is a flowchart showing a part of the operation of a controller which is a constituent of the recording apparatus;

Fig. 3 is a block diagram of a broadcast program recording apparatus using an EPG according to a second embodiment of the present invention;

Fig. 4 is a block diagram of a broadcast program recording apparatus using an EPG according to a third embodiment of the present invention; and

Fig. 5 is a block diagram of a broadcast program recording apparatus using an EPG according to a fourth embodiment of the present invention.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

Various embodiments of a broadcast program recording apparatus using an EPG according to the present invention are described below with reference to the accompanying drawings.

As shown in Fig. 1, a broadcast program recording apparatus using an EPG according to a first embodiment comprises a tuner section 11 for receiving a broadcast program containing broadcast program information, an EPG decoder section 12 for decoding broadcast program

information in the broadcast program received by the tuner section 11, an internal clock section 13 for outputting the current time, a controller 14 having recording management information produced by extracting a broadcast program to be recorded from the decoded EPG data, and a recording section 15 for performing recording, such as video recording of a broadcast program, on the basis of the recording management information.

In such a construction, the EPG decoder section 12 decodes the broadcast program information in order to create EPG data. This EPG data broadly comprises the current time, a receiving channel, a broadcasting station name, a broadcasting time, and a program title of the broadcast program which is being broadcast at this broadcasting time. Also, this EPG data may be text data which has been edited so as to have a correlation between the broadcasting time and the program title.

As shown in Fig. 2, initially, the controller 14 causes EPG data to be displayed on screen when a recording operation ("06:00 ABCD" in the embodiment) is being performed. Then, the controller 14 specifies a desired broadcasting time and a desired program title ("07:00 EFGH" in the embodiment) (step ST11).

In this state, a broadcast program start time ("07:00" in the embodiment) to be compared is extracted from the

broadcast program information of the EPG and is compared with the current time (step ST12). It is assumed that the comparison produces a match when the broadcast program start time coincides with the current time or when it is immediately after the broadcasting time. If they coincide with each other, the broadcast program is entered as a new broadcast program into the recording management information ("07:00 EFGH" in the embodiment) (step ST13).

The program entered into this recording management information is automatically recorded. As a result of the above, when a desired broadcast program is extracted automatically from among a large number of broadcast programs and is reserved, the reserved broadcast program is entered automatically into the recording management information, and can be recorded automatically. In this manner, it is not necessary to perform a new recording operation which is performed after a predetermined broadcast program is entered. Therefore, ease of operation for selecting a broadcast program can be improved.

A broadcast program recording apparatus using an EPG according to a second embodiment aims to receive broadcast program information from the outside, for example, from the Internet, as shown in Fig. 3. The broadcast program recording apparatus of this embodiment comprises a tuner section 11a for receiving a broadcast program, an EPG

decoder section 12a for directly receiving and decoding the broadcast program information by using the Internet, etc., an internal clock section 13 for outputting the current time, a controller 14 having recording management information which is created by extracting a broadcast program to be recorded from the decoded EPG data, and a recording section 15 for performing a recording, such as video recording of a broadcast program, on the basis of the recording management information.

In such a construction, the EPG decoder section 12a receives broadcast program information directly via the Internet, etc., and decodes it to produce EPG data. Then, in a manner similar to that described in the first embodiment, the broadcast start time of the EPG data is compared with the current time. If the broadcast program start time coincides with the current time or is immediately after it, the comparison produces a match, and a new broadcast program which is reserved is entered into the recording management information.

A broadcast program recording apparatus using an EPG according to a third embodiment, as shown in Fig. 4, aims to receive EPG data from the Internet, etc., and also to receive current time information from the outside. The broadcast program recording apparatus of this embodiment comprises a tuner section 11a for receiving a broadcast

program, an EPG decoder section 12a for receiving and decoding broadcast program information from the Internet, etc., a controller 14a having recording management information which is produced by extracting a broadcast program to be recorded from the decoded EPG data, and a recording section 15 for recording a broadcast program on the basis of the recording management information.

In such a construction, the EPG decoder section 12a decodes the broadcast program information obtained from the Internet, etc., in order to produce EPG data. Then, in a manner similar to that described in the first embodiment, the broadcast program start time of the EPG data is compared with the internal current time obtained from the outside. If the broadcast program start time coincides with the internal current time or is immediately after it, it is assumed that the comparison produces a match, and a new broadcast program which is reserved is entered into the recording management information.

A broadcast program recording apparatus using an EPG according to a fourth embodiment, as shown in Fig. 5, is constructed in such a way that an external tuner for receiving a broadcast program containing broadcast program information and a recording apparatus for performing a recording are separated from each other. That is, the external tuner section comprises a tuner section 11b for

receiving a broadcast program containing broadcast program information, and an EPG decoder section 12 for decoding the broadcast program information received by the tuner section 11b. The recording apparatus comprises a controller 14b having recording management information which is produced by extracting a broadcast program to be recorded from the EPG data produced by the EPG decoder section 12, an internal clock section 13 for outputting the internal current time, and a recording apparatus 15 for performing a recording, such as video recording of a broadcast program, on the basis of the recording management information.

In such a construction, in a manner similar to that described in the first embodiment, the broadcast program start time of the EPG data is compared with the internal current time. If the broadcast program start time coincides with the internal current time or is immediately after it, it is assumed that the comparison produces a match, and a new broadcast program which is reserved is entered into the recording management information.

As has thus been described, in the broadcast program recording apparatus using an EPG according to the present invention, by comparing a broadcast program start time with the current time, a new broadcast program can be entered into recording management information when the broadcast program is to be changed or immediately after it is changed.

Thus, there is an advantage in that a new broadcast program can be entered even if recording is being performed, thereby improving the ease of a recording operation by a user.

Many different embodiments of the present invention may be constructed without departing from the spirit and scope of the present invention. It should be understood that the present invention is not limited to the specific embodiments described in this specification. To the contrary, the present invention is intended to cover various modifications and equivalent arrangements included within the spirit and scope of the invention as hereafter claimed. The scope of the following claims is to be accorded the broadest interpretation so as to encompass all such modifications, equivalent structures and functions.